

Abstract

A plasma processing device comprising a chamber (1), a high-frequency power supply and an antenna unit (3). The antenna unit (3) comprises a slot plate (3c), a slow wave plate (3b) and an antenna cover (3a). A top plate unit (4) having a flat plate (4a) and sidewalls (4b) is disposed at the upper portion of the chamber (1). The flat plate (4a) contacts the slot plate (3c) disposed to face a housed substrate (11). The sidewalls (4b) are formed so as to extend toward a substrate-disposed side from the periphery of the flat plate (4a). The outer periphery surfaces of sidewalls (4b) contact the chamber (1). The thickness of the sidewalls (4b) is set to be at least $\lambda_g/4$, where λ_g is the wavelength of a microwave based on the permittivity of the top plate (4). Accordingly, a plasma density can be further increased and a uniformity in plasma density distribution can be improved.